occur on a displayed image.

REMARKS

The Applicants appreciate the Examiner's thorough examination of the subject application and request reconsideration of the subject application based on the foregoing amendments and the following remarks.

Claims 1 through 28 are pending in the subject application. Claims 1 through 28 stand rejected under 35 U.S.C. 112, first and second paragraphs.

Claim 1 was amended to address the Examiner's non-art based rejections, only. Added claims 29 and 30 were written to address the Examiner's rejections and to more distinctly claim applicant's invention. The amendments to the claims are supported by the originally filed disclosure.

The specification including the TITLE was objected to and correction required. The specification including the title was amended to address the Examiner's objections. The amendment to the specification does not introduce new matter because it either is editorial in nature or is supported by the originally filed disclosure.

35 U.S.C. 112, FIRST PARAGRAPH REJECTIONS

Claims 1 through 28 stand rejected under 35 U.S.C. 112, first paragraph, as

containing subject matter that was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The Applicants respectfully traverse. Because claim 1 was amended in the instant amendment, the following discussion refers to the language of the amended claim. The specification was also objected to for the foregoing reasons.

Specifically, the Examiner states on page 3 of the Office action that the specification does not make clear enough what is being claimed as far as what the dependence of the index of refraction with respect to wavelength needs to be. The Examiner further states that it is unclear (i) if the index is such that in a parallel cell (or some other cell), in an unpowered state, the wavelength response is set so that the color is viewing angle dependent, or (ii) if the current cell is set up to give the desired end goal of viewing angle dependence. However, the Applicants respectfully contend that the specification clearly describes what is being claimed.

For example, it is mentioned on page 12, lines 8 through 15, of the application that the Applicants discovered that *the variations in the refractive index anisotropy of the liquid crystal material in the liquid crystal layer with wavelengths of rays of light substantially affect the coloration on a liquid crystal screen* (display screen), which the Applicants assert is a surface of the liquid crystal display device where an image can be displayed.

It is further mentioned on page 26, lines 1 through 11, of the application, that the liquid crystal layer is made up of such a liquid crystal material that the refractive index anisotropy Δn thereof satisfies a predetermined condition to produce the best properties when combined with the compensation function of phase difference by the phase difference plates; *i.e., the refractive index anisotropy Δn is set in such a range that the variations in the refractive index anisotropy Δn with wavelengths of rays do not cause viewing-angle-dependent coloration on the above-described liquid crystal screen.*

For example, it is mentioned on page 26, lines 15 through 22, of the application that, in a first embodiment of the invention, the difference between the refractive index anisotropy $\Delta n(450)$ of the liquid crystal material for rays of light having the wavelength of 450 nm and the refractive index anisotropy $\Delta n(650)$ thereof for rays of light having the wavelength of 650 nm, *i.e., the difference, $\Delta n(450) - \Delta n(650)$, is set in a range not less than 0.0070 to not more than 0.0250.* Further, in a preferred embodiment, *the difference, $\Delta n(450) - \Delta n(650)$, is set in a range not less than 0.0200 to not more than 0.0250.* The Applicants therefore contend that the specification clearly indicates what is being claimed as to, *e.g.*, the relationship between the index of refraction and the wavelength of light.

Further, because the application discloses that *an optical property* of the liquid crystal, *e.g.*, the difference, $\Delta n(450) - \Delta n(650)$, is set in specific ranges for preventing the

coloration phenomenon from developing on the display surface of the liquid crystal display device, the Applicants assert that the index of refraction is such that, *e.g.*, in a parallel cell (or some other cell), in an unpowered state, the wavelength response is set so that the color is viewing angle independent (see also the Examiner's statement on page 3 of the Office action, indicated as (i) above).

In view of the Applicants' above-described assertion, the Applicants further contend that curves corresponding with "birefringent plates" (as mentioned by the Examiner on page 3 of the Office action) are conventional; and, a detailed description of those curves is therefore not required for providing an enabling disclosure under 35 USC 112, first paragraph.

Accordingly, claims 1 through 28 satisfy the requirements of 35 U.S.C. 112, first paragraph and, therefore, these claims are allowable and the specification is considered acceptable.

35 U.S.C. 112, SECOND PARAGRAPH REJECTIONS

Claims 1 through 28 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that the Applicants regard as the invention. As provided above, claim 1 was amended to address the non-art concerns specifically identified by the Examiner. Further, added claims 29 and 30 were written giving consideration to the concerns

raised by the Examiner. The Applicants believe that the areas of rejection have been identified and addressed in the foregoing amendment.

The Examiner states on page 2 of the Office action that the statement, "a liquid crystal material of which the refractive index anisotropy is specified to vary with wavelengths of rays of light within a range that allows no viewing angle dependent coloration to occur on a liquid crystal screen," is ambiguous. Specifically, the Examiner asks, "on what liquid crystal screen is this referring to – is it the claimed invention or a hypothetical screen?"

The Applicants have amended claim 1 for more definitively reciting that the liquid crystal layer is constituted by a liquid crystal material of which the refractive index anisotropy is specified to vary with wavelengths of rays of light within a range that allows no viewing-angle dependent coloration to occur *to an image displayed on the liquid crystal display element.* Accordingly, the offending phrase, "on a liquid crystal screen," has been deleted.

The Examiner also states on page 2 of the Office action that it must be that compensation occurs for some specific liquid crystal configuration (assuming it is for a hypothetical screen), such as in a cell which is untwisted and in an unpowered state. The Examiner further states that if the cell were instead intended as being the current cell, and that therefore the curve of the liquid crystal material was not specified by this,

then a first paragraph rejection under § 112 may need to be applied.

The Applicants assert that the above-mentioned liquid crystal screen is a hypothetical screen because it is not a screen as a physical object, but rather a display state. Accordingly, as explained above, the curves corresponding with "birefringent plates" (as mentioned by the Examiner on page 3 of the Office action) are conventional; and, a detailed description of those curves is therefore not required for providing an enabling disclosure under 35 USC 112, first paragraph.

The Examiner states on page 3 of the Office action that, at least through dependency, the Δn x d includes the z-axis parameter instead of the x- and y-axis (in plane) parameters – in other words, it should be "a" and "c", not "b". The Applicants respectfully traverse.

For example, it is shown in FIG. 11 of the application that the three (3) principal refractive indices n_a, n_b, and n_c are aligned to the x, y, and z axes, respectively. It is also mentioned on page 47, line 17, to page 48, line 6, of the application that – "The principal refractive indices n_a, n_b, and n_c of the phase difference plates **32** and **33** (see FIG. 10 of the application) are such that $n_a = n_c > n_b$. Therefore, there exists only one optic axis, and the phase difference plates **32** and **33** have uniaxiality and a negative refractive index anisotropy. *Because $n_a = n_c$, the phase difference plates **32** and **33** have a first retardation value $(n_c - n_a) \times d$ almost equal to 0 nm, and a second retardation value*

($n_c - n_b$) x d specified arbitrarily in the range from 80 nm to 250 nm. By specifying the second retardation value ($n_c - n_b$) x d in that range, the compensation function of phase difference by the phase difference plates **32** and **33** is surely achieved."

Because $n_a = n_c$ as explained above, the Applicants contend that the "($n_a - n_b$) x d", as recited in claims 20 through 28, is supported by the originally filed disclosure; and, claims 20 through 28 therefore definitively recite the Applicants' invention.

Accordingly, it is respectfully submitted that claims 1 through 28 satisfy the requirements of 35 U.S.C. 112 and, as such, are in a condition for allowance.

CLAIMS 29-30

As indicated above, claims 29 and 30 were added to more distinctly claim embodiments of the present invention. These claims, as provided below, are clearly supported by the originally filed disclosure, including the originally filed claims.

For example, added claims 29 and 30 are based on claims 1 and 15 as filed. Specifically, added claims 29 and 30 were written for definitively reciting the novel combination of elements, as disclosed throughout the application, from which advantages of the claimed invention are derived; *i.e.*, the combination of (1) a liquid crystal with enhanced properties, and (2) a phase difference plate in which the principal refractive indices n_a, n_b, and n_c are specified in relation to each other.

SPECIFICATION OBJECTIONS

The Examiner objected to the specification of the subject application, including the TITLE and requested correction thereof. The following addresses the specific objections of the Examiner.

TITLE

The Examiner objected to the TITLE as not being descriptive of the invention being claimed and requested correction. The TITLE has been amended in the instant amendment to address the Examiner's objections. As such, the TITLE, as amended, is considered acceptable.

It is respectfully submitted that the subject application is in a condition for allowance. Early and favorable action is requested.

Because the total number of claims and/or the total number of independent claims in the subject application post amendment now exceed the highest number previously paid for, a check is enclosed herewith for the required additional fees. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge Deposit Account No. **04-1105**.

Respectfully submitted,

DIKE, BRONSTEIN, ROBERTS
& CUSHMAN

Date: January 4, 2000

By: Richard E. Gamache

Richard E. Gamache
(Reg. No. 39,196)
130 Water Street
Boston, MA 02109
(617) 523-3400

#132506 v1 - 47964 Amendment A